

## FUNCTIONAL AREA 5

### Database Administration (DBA)

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Incumbents in this functional area plan, design, develop, test, implement, secure, and administer database systems. Database Administration applies to all Database Management Systems (DBMSs) regardless of architecture (relational, hierarchical, object-oriented, etc.). The database(s) may reside on mainframe or mid-range computer(s) or PC server(s). At the more advanced levels (ITS III and above), incumbents develop and administer policies and procedures for evaluating, selecting, designing, implementing, administering, and integrating databases and database management systems; provide technical expertise and support for databases that are large, varied, complex, clustered, and/or replicated; and develop strategic and/or tactical IT plans.

| DATABASE ADMINISTRATION  | Assistant Information Technology Specialist | Information Technology Specialist I | Information Technology Specialist II | Information Technology Specialist III |
|--|---|-------------------------------------|--------------------------------------|---------------------------------------|
| <b>Knowledge of:</b>   |   |                                     |                                      |                                       |
| Operating systems, hardware and software related to database development and administration                |   | X                                   | X                                    | X                                     |
| Computer platforms and environments and their implications for database design, performance, and usability |   | X                                   | X                                    | X                                     |
| Requirements analysis concepts, practices, methods, and principles   |   | X                                   | X                                    | X                                     |
| Data replication and propagation concepts, practices, methods, principles, and tools                       |   | X                                   | X                                    | X                                     |
| Data normalization and de-normalization  |   | X                                   | X                                    | X                                     |
| Database administration concepts, practices, methods, and principles                                       |   | X                                   | X                                    | X                                     |
| Database backup, restore, and recovery concepts, practices, methods, principles, and tools                 |   | X                                   | X                                    | X                                     |
| Database query languages   |   | X                                   | X                                    | X                                     |
| Database management systems and associated software tools  |   | X                                   | X                                    | X                                     |
| Database monitoring concepts, practices, methods, principles, and tools                                    |   | X                                   | X                                    | X                                     |
| Database testing and evaluation concepts, practices, methods, principles, and tools                        |   | X                                   | X                                    | X                                     |
| Database security concepts,  |   | X                                   | X                                    | X                                     |

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| practices, methods, principles, and tools  |  |   |   |   |
| Database change management/control concepts, practices, methods, principles, and tools   |  | X | X | X |
| System performance monitoring concepts, practices, methods, principles, and tools        |  |   | X | X |
| New and emerging database technologies and industry trends                               |  |   | X | X |
| Data administration concepts, practices, methods, and principles                         |  |   | X | X |
| Data modeling concepts, practices, methods, principles, and tools                        |  |   | X | X |
| Data storage, mining and warehousing concepts, practices, methods, principles, and tools |  |   | X | X |
| Database performance concepts, practices, methods, principles, and tools                 |  |   | X | X |
| Data integrity concepts, practices, methods, and principles                              |  |   | X | X |
| Database capacity planning and management  |  |   | X | X |
| Database logical design  |  |   | X | X |
| Database physical design   |  |   | X | X |
| Characteristics of physical and virtual data storage                                     |  |   | X | X |
| Technology infrastructure and network topology principles                                |  |   |   | X |
| Strategic and tactical IT planning   |  |   |   | X |
| Advanced physical and virtual data storage principles and implementations                |  |   |   | X |
| Advanced data storage, mining and warehousing principles and implementations             |  |   |   | X |
| Advanced database backup, restore, and recovery principles and implementations           |  |   |   | X |
| Advanced database testing and evaluation principles and implementations                  |  |   |   | X |
| Advanced database security principles and implementations                                |  |   |   | X |
| Advanced systems performance principles  |  |   |   | X |
| Advanced database performance principles and methods                                     |  |   |   | X |
| Advanced data integrity principles and methods   |  |   |   | X |
| Advanced technology infrastructure and network topology principles                       |  |   |   | X |

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| Ability to:   |  |   |   |   |
| Interpret database policies, standards and guidelines   |  | X | X | X |
| Develop database standards  |  |   | X | X |
| Define and allocate storage capacity  |  | X | X | X |
| Design, develop, test, implement, and maintain database systems   |  | X | X | X |
| Restore disrupted database systems to normal operations   |  | X | X | X |
| Maintain, monitor, and test database operations   |  | X | X | X |
| Monitor and optimize database performance   |  | X | X | X |
| Identify business or technical requirements and apply to the design, development, implementation, and maintenance of database systems |  | X | X | X |
| Identify and resolve or mitigate existing and potential security risks within the database environment                                |  | X | X | X |
| Normalize and de-normalize database physical designs  |  | X | X | X |
| Troubleshoot and resolve simple to average complexity database problems   |  | X | X | X |
| Plan, install, test, and implement database related software upgrades   |  | X | X | X |
| Identify and apply database software patches and fixes  |  | X | X | X |
| Identify and set database parameter or configuration settings for optimization and security   |  | X | X | X |
| Evaluate, plan, test, and implement data/database replication mechanisms  |  | X | X | X |
| Ensure optimal use of database products   |  |   | X | X |
| Generate complex queries and reports  |  |   | X | X |
| Plan and carry out complex database assignments and develop new methods, approaches, and procedures                                   |  |   | X | X |
| Troubleshoot and resolve complex and most complex database problems   |  |   | X | X |
| Identify emerging trends and relate them to the current and future database environment   |  |   | X | X |
| Evaluate, research and develop proposals for the acquisition of database products or services   |  |   | X | X |

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| Provide leadership in the planning, design, and implementation of data mining and warehousing systems        |  |  | X | X |
| Provide technical leadership, planning, and support for large/complex database projects                      |  |  |   | X |
| Provide advice and guidance on a wide range and variety of complex IT database issues                        |  |  |   | X |
| Demonstrate advanced technical expertise, consultation, and leadership competencies                          |  |  |   | X |
| Perform a key role in formulating database development and administration strategy and policy                |  |  |   | X |
| Apply and adapt new approaches to the design, development, and implementation of database management systems |  |  |   | X |
| Develop new concepts, practices, methods, and standards for database development and administration.         |  |  |   | X |
| Evaluate and recommend adoption of new or enhanced approaches to delivering database services                |  |  |   | X |
| Use advanced database capacity planning methods and tools  |  |  |   | X |

### ***Information Technology Specialist I, (Database Administration)***

Incumbents apply a basic understanding of database administration. Under technical direction and guidance, incumbents apply basic principals and practices in developing and managing databases. They use software tools for accessing, updating, backing up, restoring, and recovering databases, file structures and tables. They assist more experienced staff with the administration of database operations and are able to perform routine functions independently. Incumbents perform analysis and planning of work to complete assignments.

### ***Information Technology Specialist II, (Database Administration)***

Incumbents demonstrate proficient technical IT competencies, with a specialization in database administration. Incumbents apply knowledge of the organization's technology and business infrastructure to effectively analyze, design, develop, test, implement, and maintain database management systems that meet the organization's business requirements and performance expectations. They evaluate and recommend database administration tools; participate in database needs analysis, capacity planning, and risk assessment; and maintain database integrity, access, and security controls. They analyze and plan work at a detailed level.

***Information Technology Specialist III, (Database Administration) RANGE A***

At the Specialist III Range A level, incumbents demonstrate expertise in database management concepts, principles and methods. They possess expert knowledge of a single DBMS or have proficiency with multiple or diverse database environments. Incumbents serve in a lead capacity and direct the work of assigned staff and/or serve as expert specialists who work independently and deal with complex database management systems. They troubleshoot complex database and system environment problems. They develop and implement complex IT solutions, strategies, processes, and standards. Expert level specialists also develop and administer database standards, policies, and procedures. They analyze and plan complex work at a detailed level.

***Information Technology Specialist III, (Database Administration) RANGE B***

Allocations at Range B possess the highest level of technical knowledge and database administrator responsibility for large, critical, and/or most complex database environments. Incumbents in this range play a key role in formulating IT strategy and policy across the organization and demonstrate advanced technical expertise, consultation, and leadership competencies. They have in-depth understanding of the enterprise technology infrastructure, including databases, applications, software tools, standards, methodologies, protocols, platforms, hardware/software, and network topology. They work with all levels of technical and management staff to achieve solutions for the most complex and critical projects.